

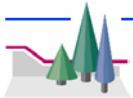
Timber Supply Analysis for DFAM Licensees

Introduction to FSSIM 3.0

Reference: Technical Workshop Course Notes, Sections 5, 6, 7

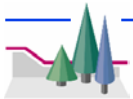


Cortex Consultants

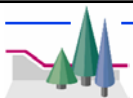
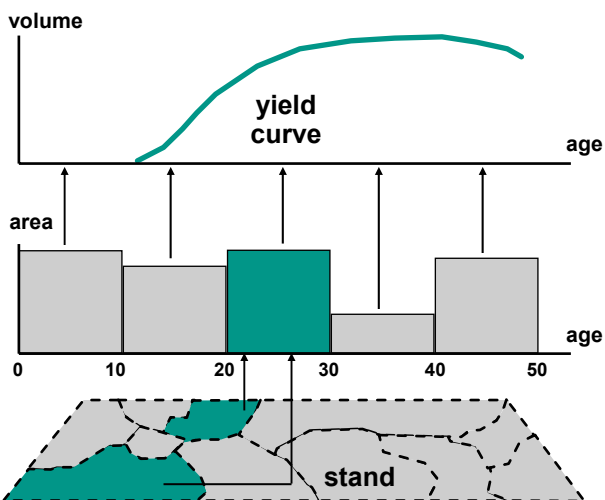


FSSIM input files—

- inventory
- yield
- management
- control



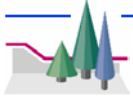
FSSIM input files— inventory: assigning stands to classes



FSSIM input files--- analysis units

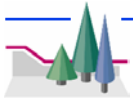
Analysis units represent hectares that are similar with respect to:

- species composition and site productivity
- expected growth & yield
- management activities (treatments) to be applied



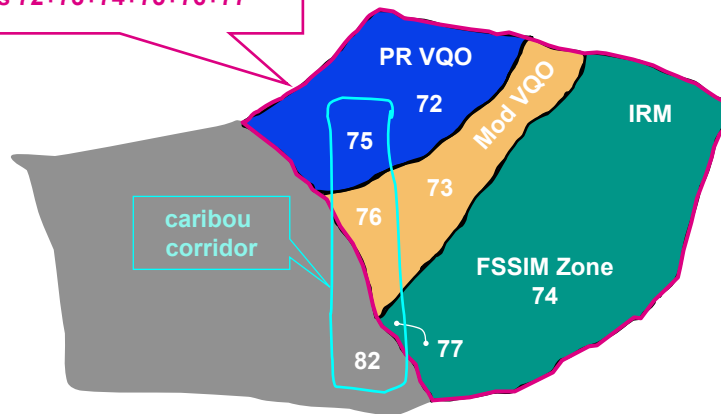
Considerations in defining analysis units

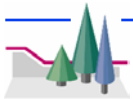
- species
- site index
- silviculture practices
- regeneration assumptions
- immature plantation history
- post-harvest development



FSSIM input files— inventory: landbase relationships

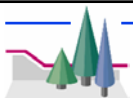
Flatbed L.U. (an FSSIM group)
= Zones 72+73+74+75+76+77





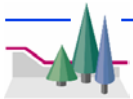
Landbase: FSSIM operability designations

operable	can be harvested under current practices; contributes to non-timber management objectives
inoperable	will not be harvested under current practices, but contributes to non-timber management objectives
deferred	not available for harvesting today, but will become available at a future specified time; contributes to non-timber management objectives
non-contributing	will never be available for harvesting, and does not contribute to non-timber management objectives



“Contribution” to forest cover requirements

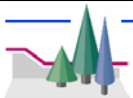
class type	eligible for harvest?	contributes to constraints?
O (operable)	yes	yes
I (inoperable)	no	can
D (deferred)	can be	can
N (non-contributing)	no	no



FSSIM input files— inventory

➤ class.dat

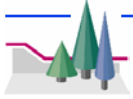
Zone	AU	Block	Age	Area	ClassType	ReversionAge
72	3	1	80	23.14	I	
74	3	1	80	512.00	I	
74	3	1	90	345.67	I	
74	3	1	90	187.89	O	
.
83	3	1	70	37.89	I	
84	6	1	170	183.33	O	



FSSIM input files— inventory

➤ group.dat

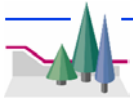
Group	Type	Zone	AU	Block	AgeLow	AgeHigh	CType
Flatbed	f	72	1	1	n/a	n/a	n/a
Flatbed	f	72	2	1	n/a	n/a	n/a
Flatbed	f	72	101	1	n/a	n/a	n/a
Flatbed	f	72	ROAD	1	n/a	n/a	n/a
Redwillow	f	82	1	1	n/a	n/a	n/a
Flat-PR	f	72	1	1	n/a	n/a	O
Red-MOD	f	83	1	1	n/a	n/a	O
Red-IRM	f	84	1	1	n/a	n/a	O
ROAD	f	n/a	ROAD	1	n/a	n/a	n/a



FSSIM input files— inventory

➤ landoaf.dat

Zone	AU	LandOAF
72	n/a	1.0
73	n/a	1.0
74	n/a	1.0
82	n/a	1.0
83	n/a	1.0
84	n/a	0.95

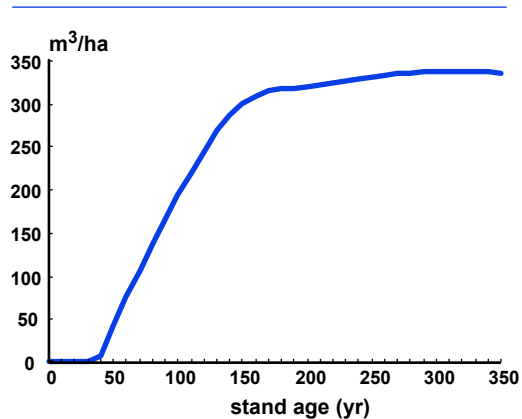


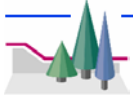
Projecting yield

volume table

age	volume
0	0.00
10	0.00
20	0.00
30	0.00
40	7.20
50	41.44
60	74.60
70	106.24
⋮	⋮
330	336.94
340	336.30
350	335.37

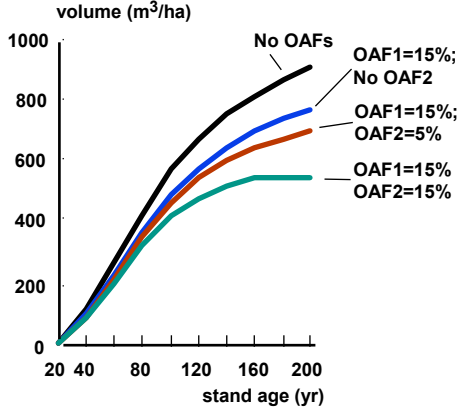
yield curve





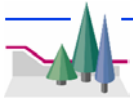
TIPSY operational adjustment factors (OAFs)

yield curves with different OAFs
 (Interior Douglas-fir, SI 22)



comparing OAFs with both set at 10%

age (yr)	OAF1(%)	OAF2(%)
0	10	0
10	10	1
20	10	2
30	10	3
40	10	4
50	10	5
:	:	:
100	10	10
:	:	:
150	10	15



FSSIM input files—yield

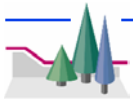
➤ vols.dat

Table: 1

Age	Volume
10	0.0
20	0.0
30	2.0
:	:
350	335.4

Table: 2

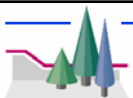
Age	Volume
10	0.0



FSSIM input files— yield

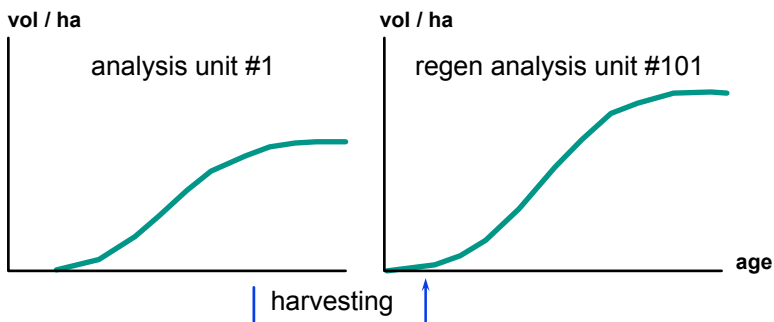
oaf.dat

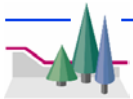
Table	MHA	AdjacencyAge	RefAge	VolOAF1	VolOAF2
1	100	1	1	1.00	0.00
2	110	1	1	1.00	0.00
3	120	1	1	1.00	0.00
.
101	80	1	1	1.00	0.00
102	100	1	1	1.00	0.00
103	110	1	1	1.00	0.00
.
999	1000	1	1	1.00	0.00
ROAD	1000	1	1	1.00	0.00



Regeneration after harvesting

- After harvesting, FSSIM:
 - assigns harvested hectares to regeneration analysis unit (RAU)
 - sets age of harvested hectares to (RegenAge + Offset)

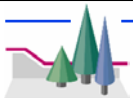




FSSIM input files— management

➤ regen.dat

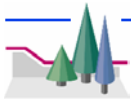
Zone	AU	PC	RegenAU	RegenAge	Offset	ReEntryLag
72	1	100	101	-4	0	0
72	2	100	102	-4	0	0
72	3	100	103	-4	0	0
72	4	100	104	-4	0	0
72	5	100	105	-4	0	0
72	6	100	106	-4	0	0
73	1	100	101	-4	0	0
.
.



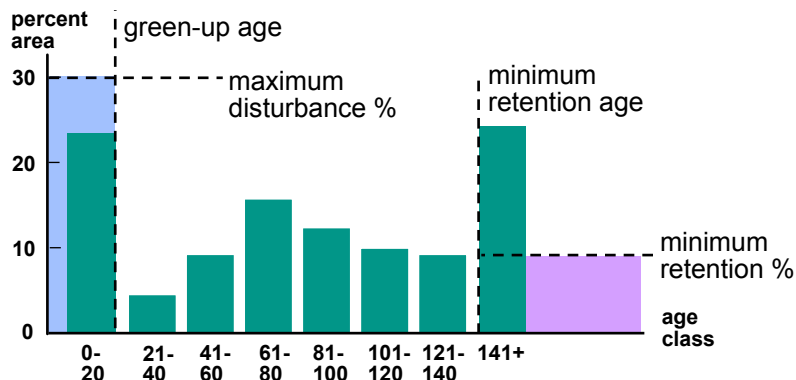
FSSIM input files— management

➤ targets.dat

UnitType	UnitID	Start	End	MinArea	MaxArea	MinVolume	MaxVolume
ZONE	0	1	25	n/a	n/a	0.0	35000.0
ZONE	0	2	25	n/a	n/a	0.0	30000.0
ZONE	0	3	25	n/a	n/a	0.0	25000.0
ZONE	0	10	25	n/a	n/a	0.0	35000.0

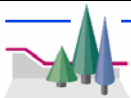


Forest cover requirements



➤ **axs.dat**

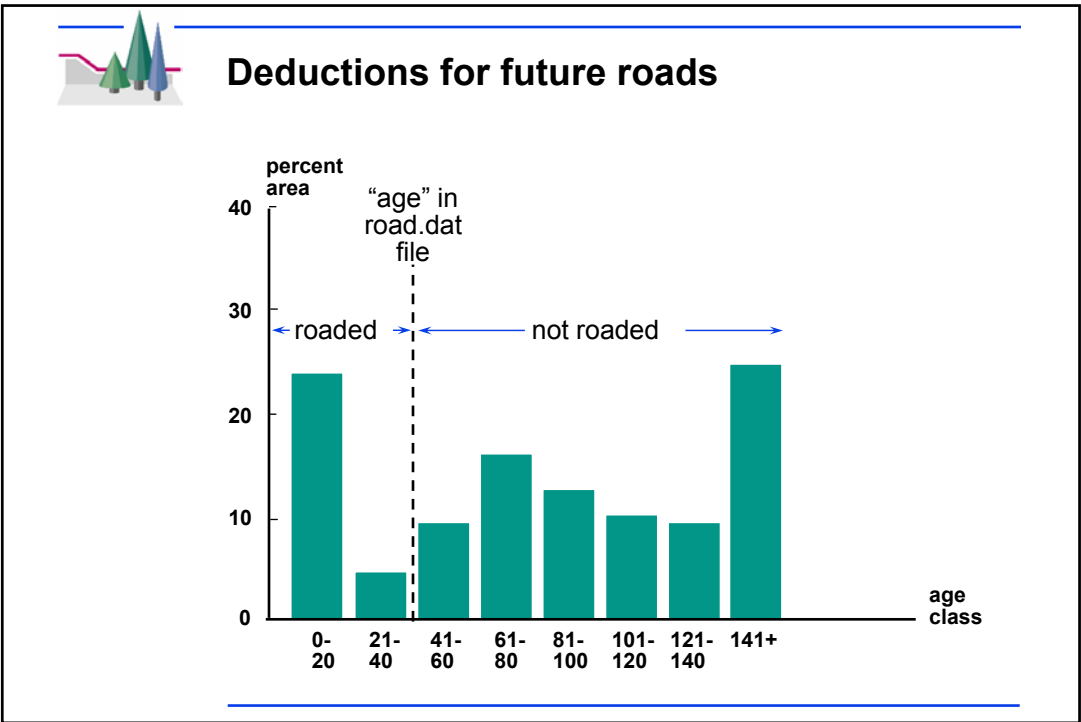
UnitType	UnitID	Start	End	Constraint
GROUP	Flatbed	1	25	30.0 < 20
GROUP	Flatbed	1	25	10.0 >= 140



FSSIM input files— management

➤ **axs.dat**

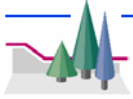
UnitType	UnitID	Start	End	Constraint
GROUP	Flatbed	1	25	54.0 < 40
GROUP	Flatbed	1	25	23.0 >= 100
GROUP	Flatbed	1	25	11.0 >= 140
GROUP	Redwillow	1	25	54.0 < 40
GROUP	Redwillow	1	25	23.0 >= 100
GROUP	Redwillow	1	25	11.0 >= 140
GROUP	Flat-PR	1	25	13.0 < 28
GROUP	Flat-MOD	1	25	24.0 < 28
GROUP	Flat-IRM	1	25	33.0 < 20
GROUP	Red-PR	1	25	13.0 < 28
GROUP	Red-MOD	1	25	24.0 < 28
GROUP	Red-IRM	1	25	33.0 < 20



FSSIM input files—management

➤ **road.dat**

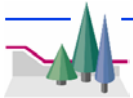
Zone	AU	Age	PC	RoadAU	RegenAge	Offset	ReEntryLag
72	1	31	5	ROAD	-1000	0	0
72	2	31	5	ROAD	-1000	0	0
72	3	31	5	ROAD	-1000	0	0
72	4	31	5	ROAD	-1000	0	0
72	5	31	5	ROAD	-1000	0	0
72	6	31	5	ROAD	-1000	0	0
73	1	31	5	ROAD	-1000	0	0
73	2	31	5	ROAD	-1000	0	0
.



FSSIM input files— management

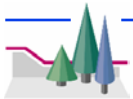
➤ **priority.dat**

Zone	AU	Group	Start	End	Priority (1: High; 100: Low)
72	n/a	n/a	1	25	1
73	n/a	n/a	1	25	2
74	n/a	n/a	1	25	3
82	n/a	n/a	1	25	1
83	n/a	n/a	1	25	2
84	n/a	n/a	1	25	3



FSSIM harvest rules

- 1 absolute oldest first
 - 2 relative oldest first
 - 3 absolute youngest first
 - 4 randomized
-



FSSIM input files— control

➤ param.dat

Plan Horizon: 25

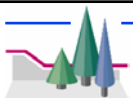
Period Period Length

1 10

➤ config.dat

Harvest Rule [1..4]: 2

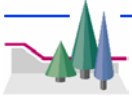
etc.



FSSIM input files— control

➤ reports.dat

UnitType	Unit	IHRS	IHRE	IMRS	IMRE	IHSS	IHSE	IMSS	IMSE	ARS	ARE	LRS	LRE	HRS	HRE
GROUP	Flatbed	1	25	1	25	1	25	1	25	1	25	1	25	1	25
GROUP	Redwill.	1	25	1	25	1	25	1	25	1	25	1	25	1	25
GROUP	Flat-PR	1	25	1	25	1	25	1	25	1	25	1	25	1	25
GROUP	Flat-M	1	25	1	25	1	25	1	25	1	25	1	25	1	25
GROUP	Flat-IRM	1	25	1	25	1	25	1	25	1	25	1	25	1	25
GROUP	inoperbl	1	25	1	25	1	25	1	25	1	25	1	25	1	25
GROUP	ROAD	1	25	1	25	1	25	1	25	1	25	1	25	1	25



FSSIM simulation process

- read data files
- schedule harvest
- report pre-harvest conditions
- harvest area from classes
- regenerate harvested areas
- increase age of all classes
- report post-harvest conditions